

CAPSOZYME® T

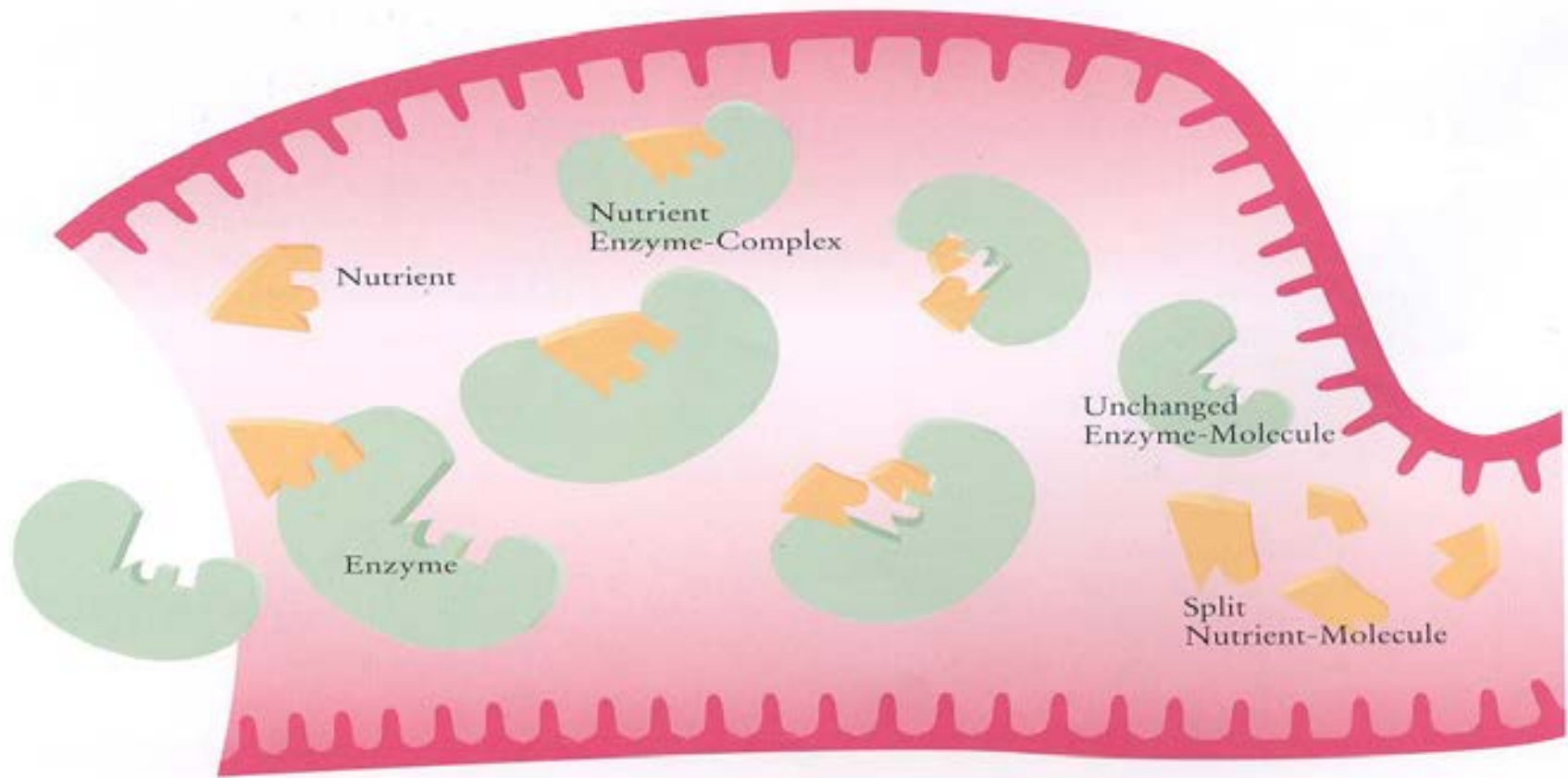
Zootechnical additive aimed at
improving animal performance and
profitability



Enzimas (I)

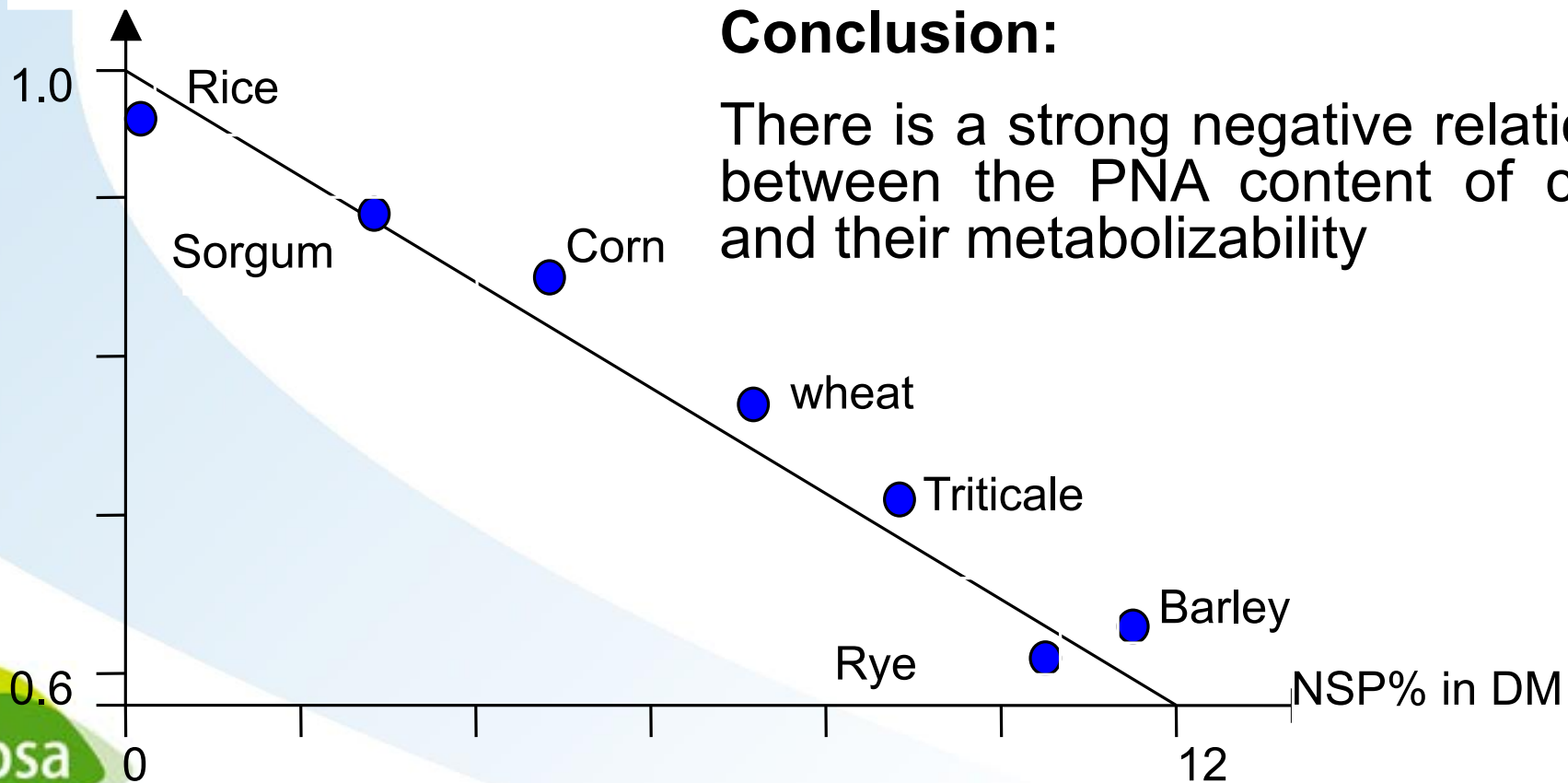
- Cereals and in particular wheat, triticale and rye are very rich in NSP pentosanes.
- NSP (xylans, manans, arabans...) impair digestion of other energetic raw materials like starch, and so diminish the potential performance of the diet.
- The usage of specific enzymes in cereal-based formulated diets, gives the opportunity to reduce detrimental effects on digestion, transport and nutrient absorption processes, and thus obtaining better values in productive parameters.

Mode of action: Key-and-lock principle



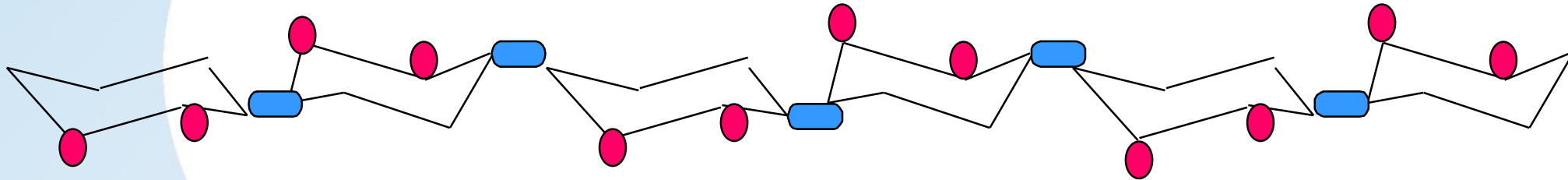
Enzymes (II) Relationship between metabolizability of cereals and their content in PNA

AME/GE AME/GE = Apparent metabolizable energy / Gross energy

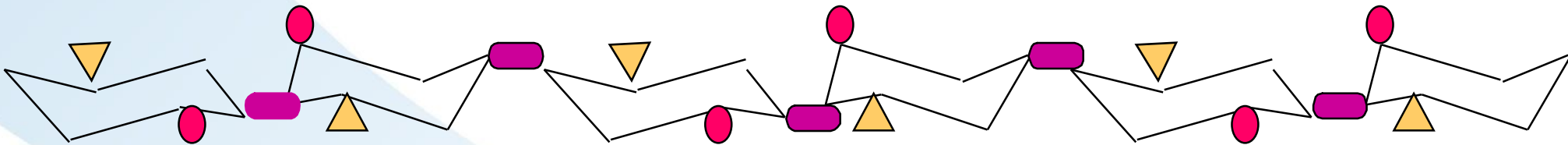


Enzymes (III) NSP

Arabino-xylans (in pentosans) as in wheat, rye, triticale



β -glucans (in celluloses) as in barley

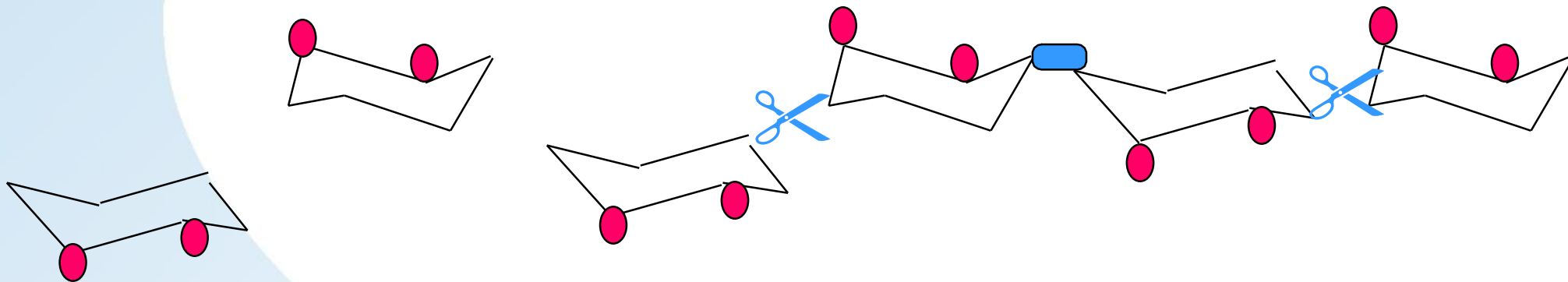


The three-dimensional structure and links between different chains make them more complex

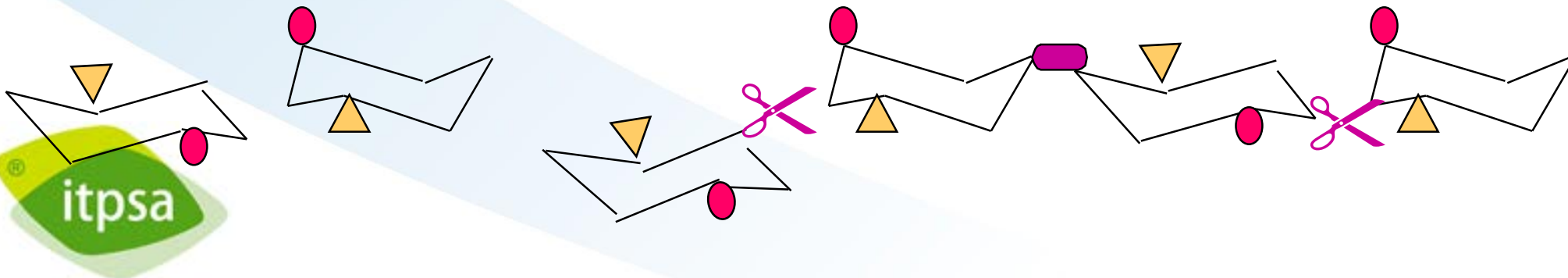
Enzyms (IV)



= Xylanase-enzyme action: the initial non-digestible chain is reduced to digestible molecules



= glucanase-action of the enzyme: the initial non-digestible chain is reduced to digestible molecules



CAPSOZYME T

Action against arabinoxylans:

Endo-1,4-beta-xylanase (3.2.1.8)

Cellulase effect and degradation of cellulose & hemicellulose.

xylanase is the exact combination of enzymes to *maximize* the digestibility of based Wheat or Corn diet.



Importance of enzymes in the animal feed industry

Problem

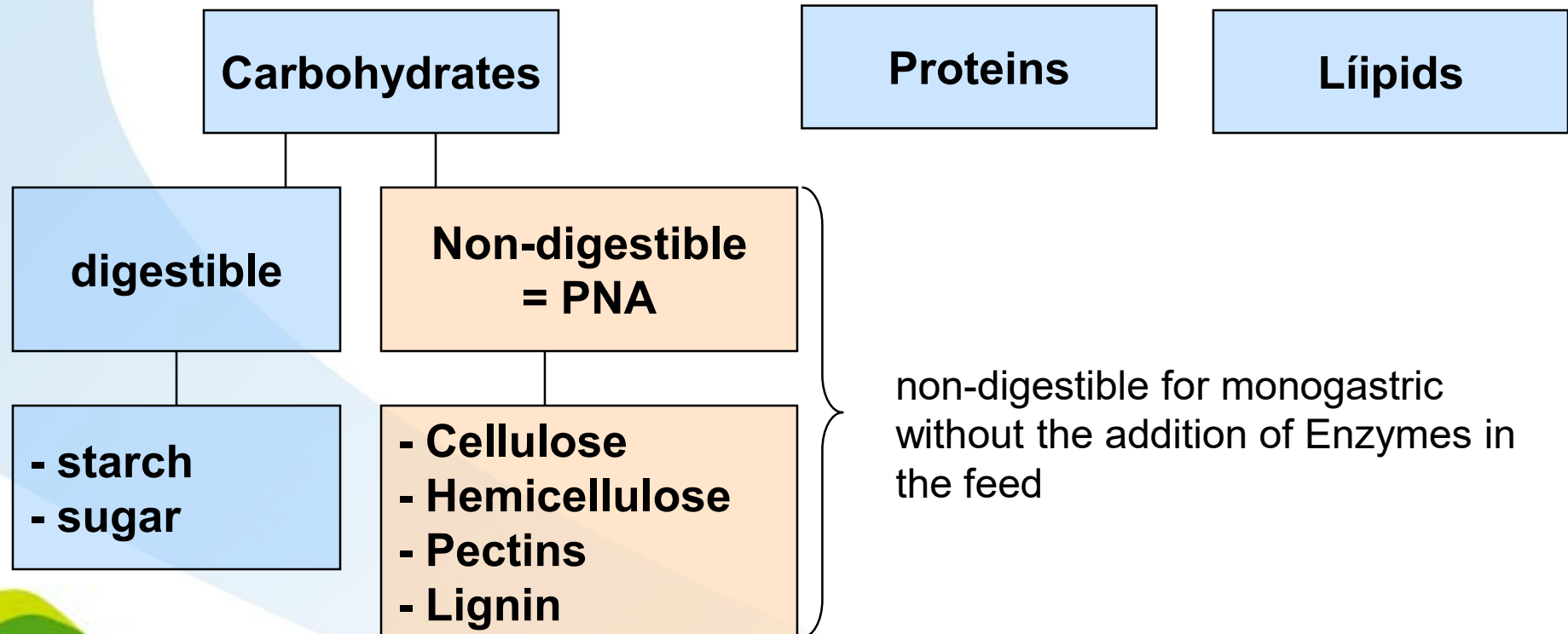
- Nutrients of high value in the diet are eliminated because the animal does not have enzymes to digest them.
- Nutrients are lost, low productivity
- They can "revalorize" low-value vegetable proteins or by-products of the food industry = "animals as waste converters"

Solution

- Enzymes "unlock" high-value nutrients, and make them available for animals
- Less waste and less environmental pollution
- Greater performance of natural resources, which are limited



Why are Enzymes necessary? Function of the PNAs



¿Digestive Problems caused by NSPs?

“Cage Effect”

The PNA components of the cell wall trap other nutrients (starch, fat and protein), which would otherwise be digestible

- less energy available for the animal

↑ Increased digesta viscosity

PNAs store a large amount of water, so they swell, resulting in:

- Increase in viscosity
- Increase of feed passage rate
- Decreased of nutrient absorption (mucosa)
- increase in fermentation
- Increased deconjugation of bile acids
- decreased ileal digestibility of fat and protein.

How can CAPSOZYME solve these Digestive Problems caused by NSPs? Solution

“Cage Effect”

CAPSOZYME

Splits NSP molecules and releases nutrients for resorption

Increased digesta viscosity

CAPSOZYME

Breaks down high-molecular NSP compounds into low-molecular, non-gel-forming components

Anti-nutritional carbohydrates in feeds

Ingredients	Sucrose	Raffinose	Stachyose	Xylans	Beta Glucan	Mannans
Corn	1.30	0.20	0.10	8.80	0.10	0.20
Wheat	1.10	0.40	0.20	9.80	0.80	0.50
SBM	7.70	1.34	5.74	3.00	NP	0.60
Rapeseed	5.80	0.40	1.20	4.00	NP	0.50
Peas	3.00	0.50	2.30	3.00	NP	0.50
White Lupins	2.40	2.70	5.30	5.00	NP	0.50
Separator						
Cotton S. meal	1.60	3.50	1.50	9.60	NP	0.30
Palm Cake	1.70	0.20	NP	5.60	NP	30.0
Wheat bran	3.00	1.20	0.20	22.0	2.40	0.50

Arabinoxylans:

- Very high in corn, wheat, wheat bran, cottonseed and sunflower.
- Medium in soybean, rapeseed and lupins meals.

Endo-1,4-xylanase!!

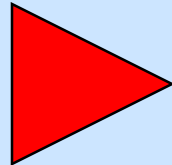


In a nutshell - Capsozyme T

- Is the brand name for enzyme preparations in a thermo-stabile powder form
- contain a Xylanase activity and β -Glucanase activity as major enzyme activity.
- Is a fermentation product from *Trichoderma lonibrachiatum*
- come as a microgranulate in bags of 25 kg
- require to be mixed into final feeds at a proper rate by licensed premixes
- is registered in the EU in Annex I of the Council Directive 70/924/EU as additives to improve feed efficacy and growth rate in broilers, laying hens, piglets and pigs
- is marketed mainly in Europe with increasing penetration in Asia
- can be readily analyzed in feeds (colorimetric assay)

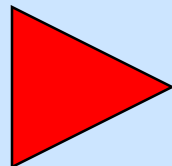
Where to use Capsozyme T?

Capsozyme T



Specifically degrades NSP
in Corn based feeds

Capsozyme T



Specifically degrades
pentosans (NSP) in wheat
based feeds or in
formulations containing
rye, soya or triticales

Benefits of using Capsozyme

- Greater nutritional value of cereals - increases metabolisable energy
- Greater flexibility in supplementation feed with lower quality at the same performance level
- Improved daily weight gain and feed conversion
- Improved N-retention and reduced nitrogen excretion
- Improved litter quality due to a reduction of sticky droppings
- Improved flock and herd uniformity in poultry and pig respectively
- Consistent feed quality even when changing varieties or including cereals from new harvest
- Synergistic effects on growth and feed conversion in combination with Salocin, Sacox and Flavomycin

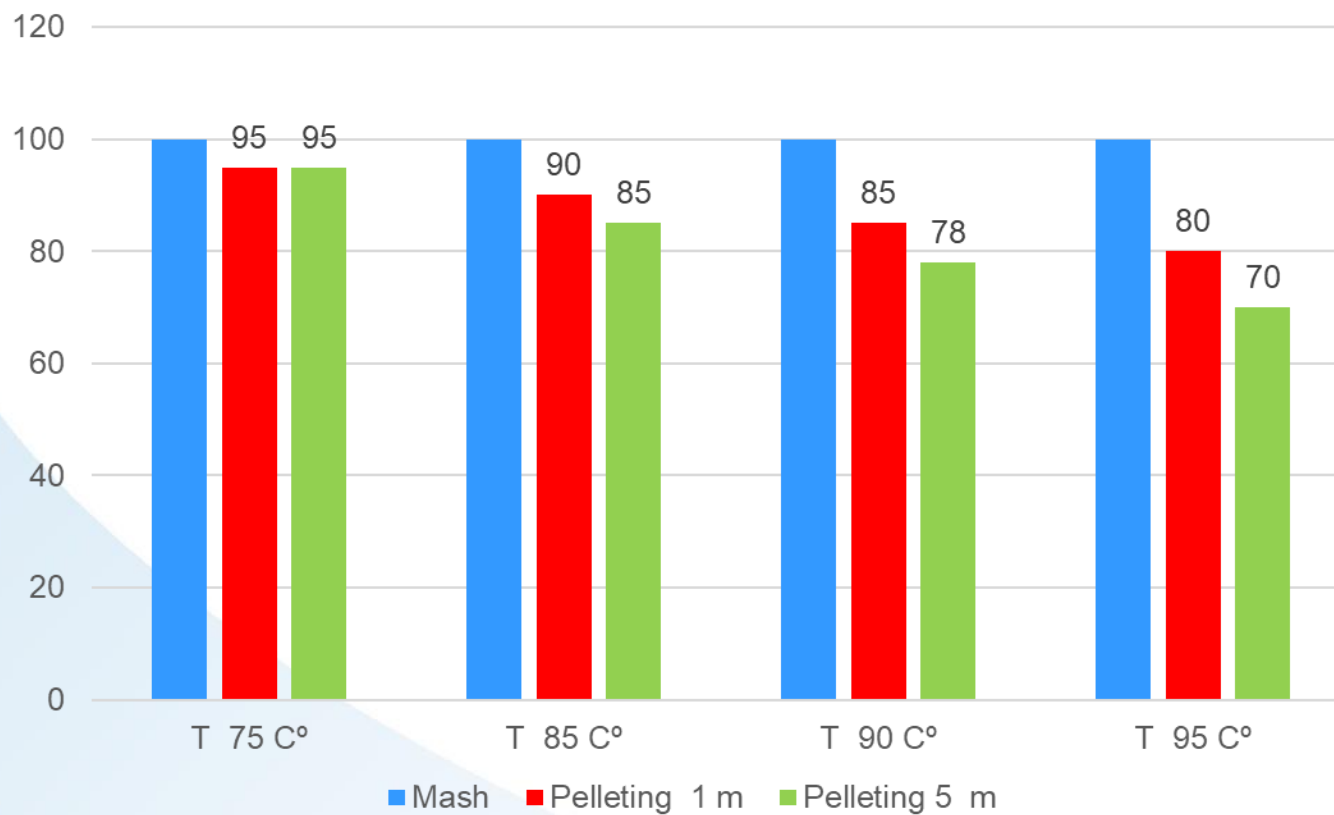
Practical application of CAPSOZYME T

1. **Over-the-top** – to improve existing animal performance (FCR, weight gain). Suitable when diets are at least adequate in Energy and CP.
2. **Re-formulation** – Taking advantage of the improved nutrient release from CZ T to reduce feed cost while maintaining animal performance.

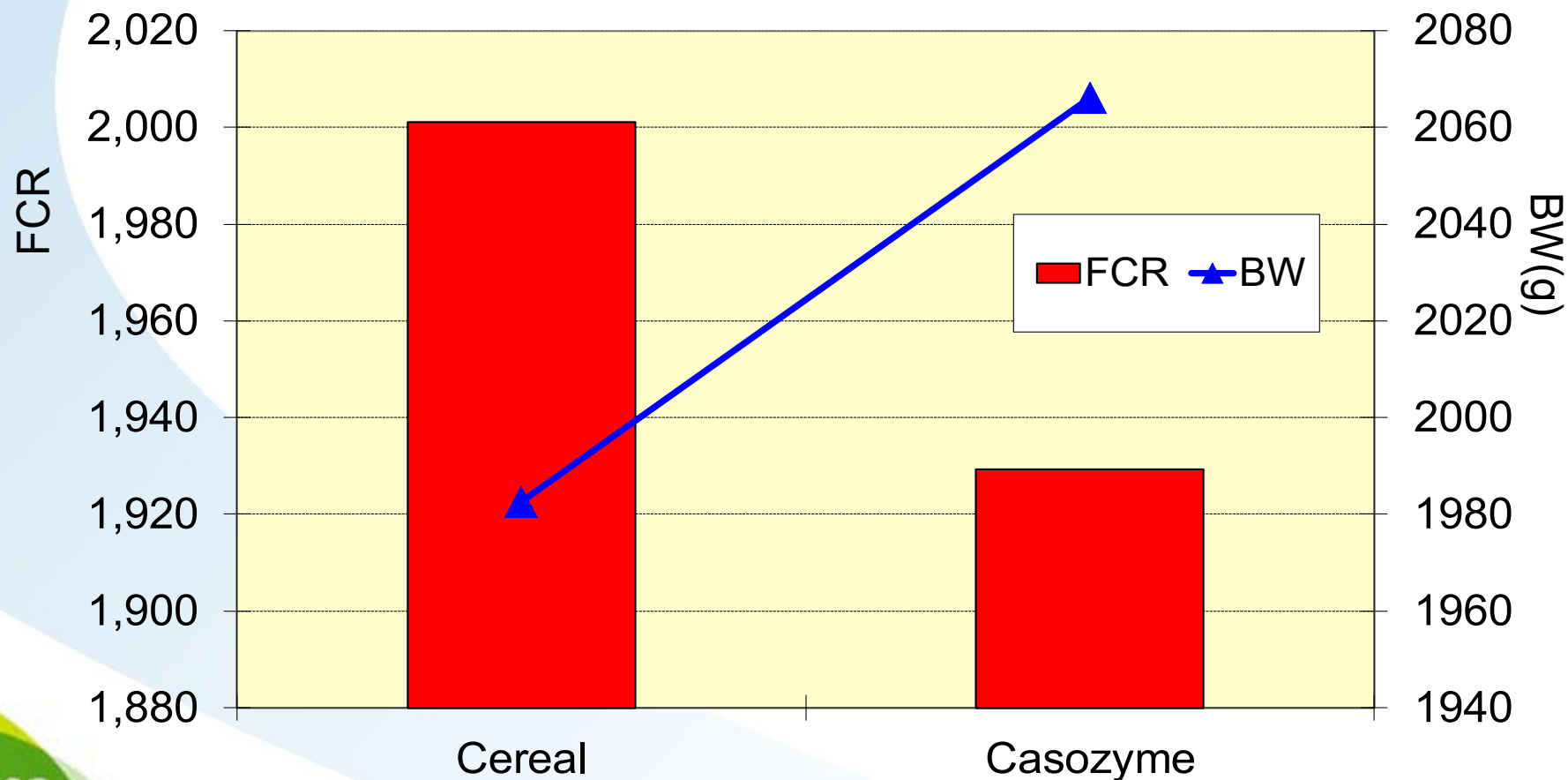


(Cereaal MATRIX – ENZYME MATRIX – DIET MATRIX)

Pelleting stability of Capsozyme T



Effect of supplementation with Capsozyme T on the productive indices of broilers (0-49 days) fed with wheat “on Top”

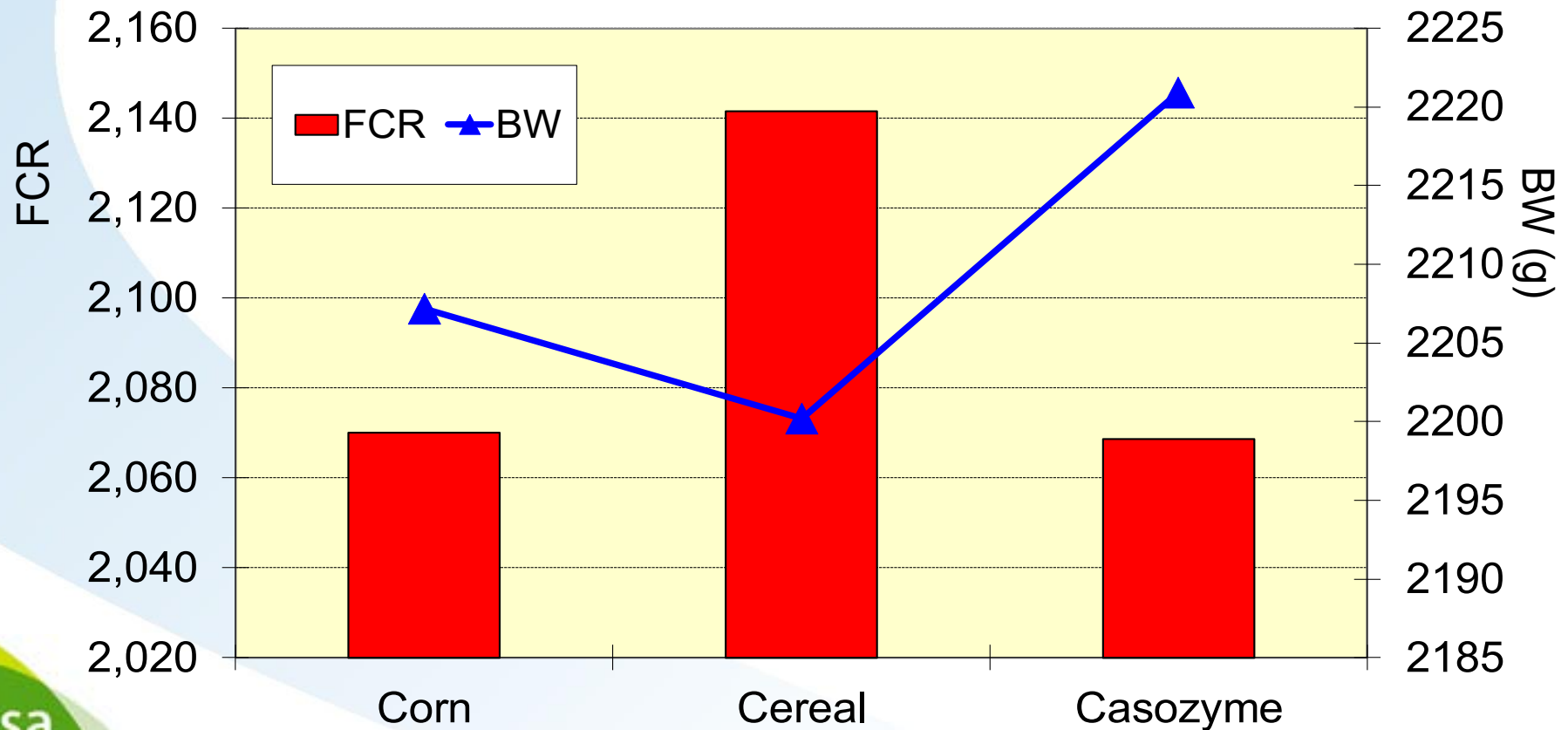


Evaluation of the efficacy of CAPSOZYME T through faeces and so, litter humidity

	Litter Humidity %	Reduction %
Control	25.8	17
Capsozyme T	21.2	

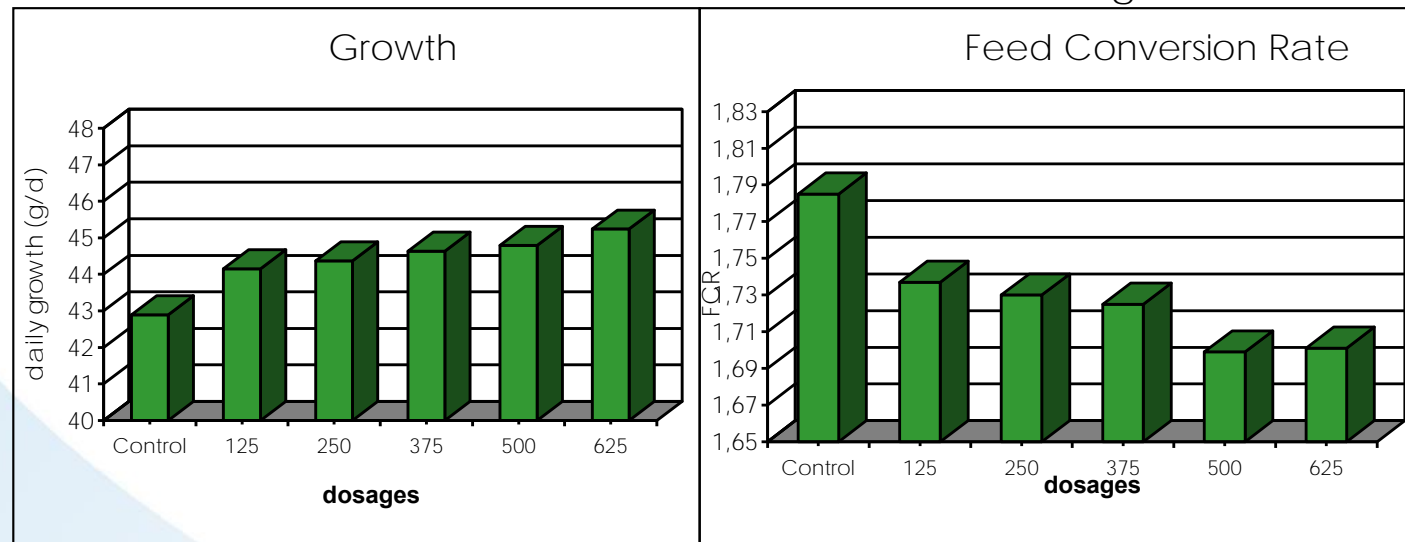
the lower water content in the litter in the case of the animals fed the enzyme supplemented diets suggests a lower proportion of sticky droppings than in control animals

Effect of supplementation with Capsozyme T on the productive indices of broilers (0-49 days) fed with wheat VS Corn “on Top”



Effect of increasing doses of CAPSOZYME T on performance of broiler chicken on a wheat based diet (9837/B)

- 18 broilers/pen, 4 pens/treatment.
- Growth trial from day 11 to day 32.
- Feed composition containing 60 % wheat, with increasing dosages of CAPSOZYME T: 0, 125, 250, 375, 500 or 625 g/Ton.

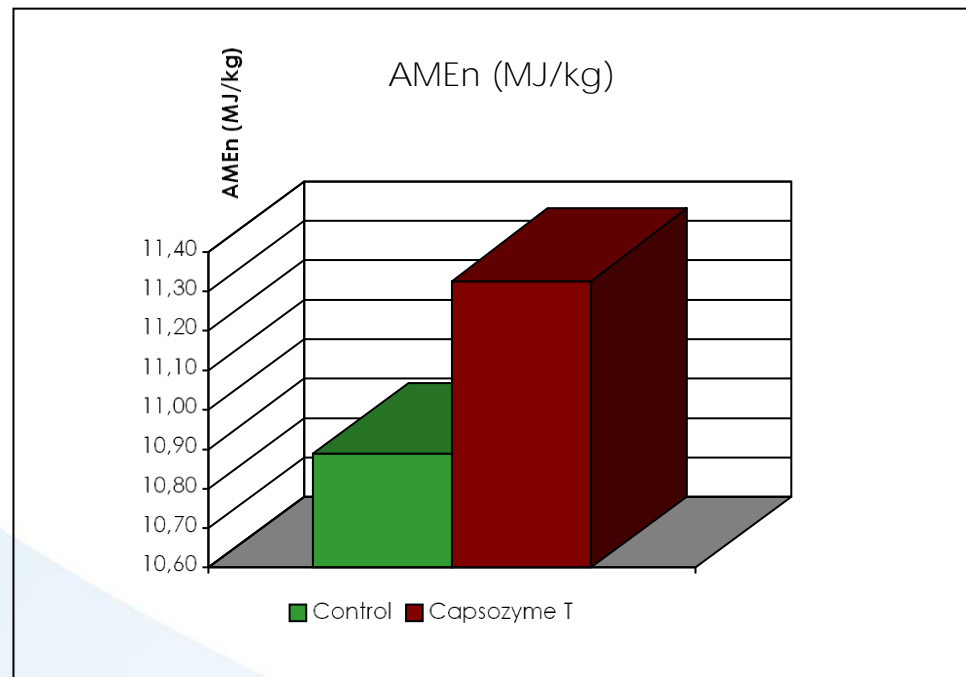


Conclusions:

- There is no variation in the Feed Intake. However, the feed is used more efficiently when xylanases are added to the diet. Consequently, there is an increase in the Weight Gain up to 5.5% compared to control birds.
- Differences for Feed Conversion Efficiency are significant, with improvements up to 5%.
- There is a dose-response relationship with increasing xylanase levels in the range used in the experiment.

Effect of CAPSOZYME T on the nitrogen-corrected apparent metabolizable energy (AMEn) of wheat in broiler chickens (9841/B).

- Trial performed at the Roslin Institute (Scotland).
- 6 pens/treatment, 30 birds/pen.
- Growth trial from day 1 to day 42.
- Feed composition containing wheat (60%) with (400 g/Ton) or without CAPSOZYME T.



Conclusions:

- There is an improvement in the AMEn of wheat when CAPSOZYME T is added to the diet. This improvement can be quantified at 6% approximately.

Thank you

